

ZXMN3A01F

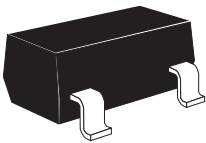
30V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}=30V$ ;  $R_{DS(ON)}=0.12\Omega$   $I_D=2.0A$

DESCRIPTION

This new generation of TRENCH MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



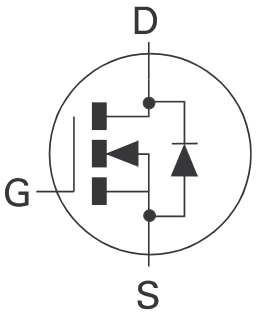
SOT23

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23 package

APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Motor control

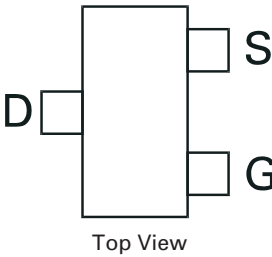


ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A01FTA	7"	12mm	1000 units
ZXMN3A01FTC	13"	12mm	4000 units

DEVICE MARKING

- 7N3



# ZXMN3A01F

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current V <sub>GS</sub> =10V; T <sub>A</sub> =25°C (b) V <sub>GS</sub> =10V; T <sub>A</sub> =70°C (b) V <sub>GS</sub> =10V; T <sub>A</sub> =25°C (a)	I <sub>D</sub>	2.0 1.64 1.81	A
Pulsed Drain Current (c)	I <sub>DM</sub>	8	A
Continuous Source Current (Body Diode) (b)	I <sub>S</sub>	1.3	A
Pulsed Source Current (Body Diode) (c)	I <sub>SM</sub>	8	A
Power Dissipation at T <sub>A</sub> =25°C (a) Linear Derating Factor	P <sub>D</sub>	625 5	W mW/°C
Power Dissipation at T <sub>A</sub> =25°C (b) Linear Derating Factor	P <sub>D</sub>	806 6.4	W mW/°C
Operating and Storage Temperature Range	T <sub>j</sub> :T <sub>stg</sub>	-55 to +150	°C

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	R <sub>θJA</sub>	200	°C/W
Junction to Ambient (b)	R <sub>θJA</sub>	155	°C/W

### NOTES

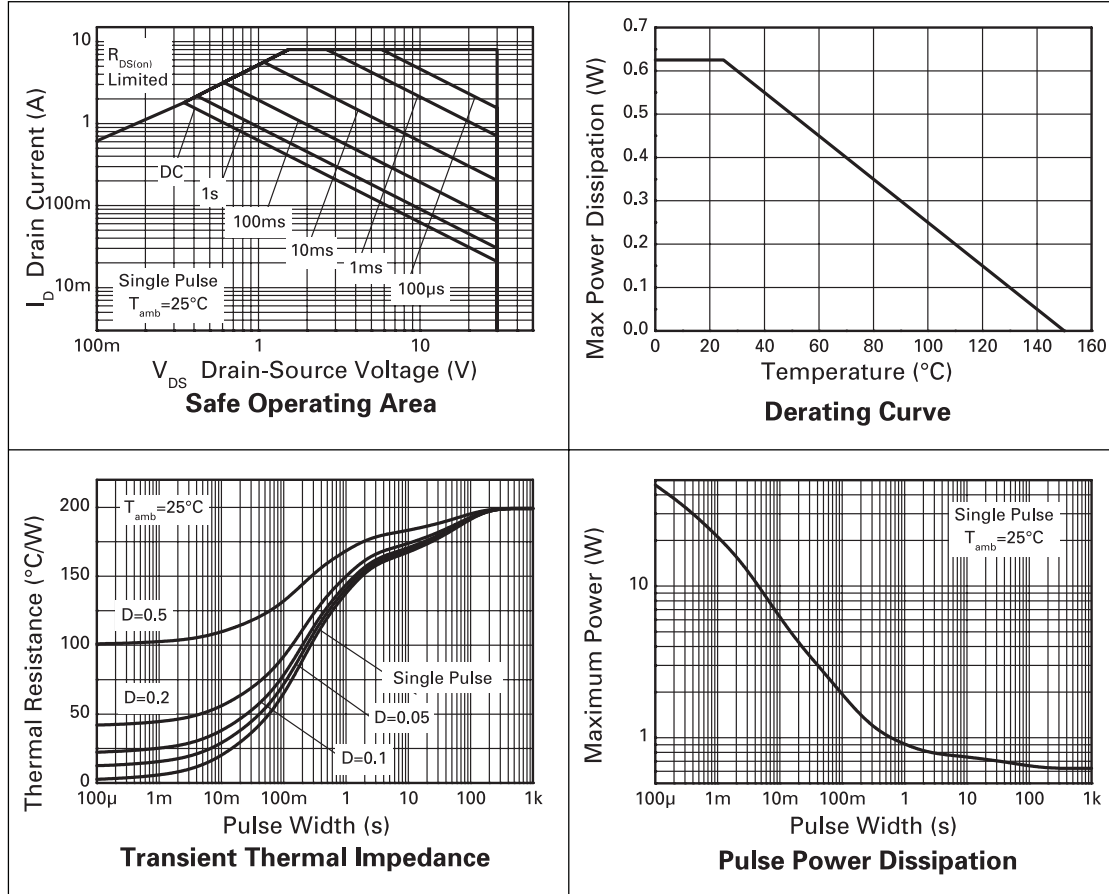
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at t ≤ 5 secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, D = 0.05, pulse width 10μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

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## CHARACTERISTICS



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**ELECTRICAL CHARACTERISTICS** (at  $T_A = 25^\circ\text{C}$  unless otherwise stated).

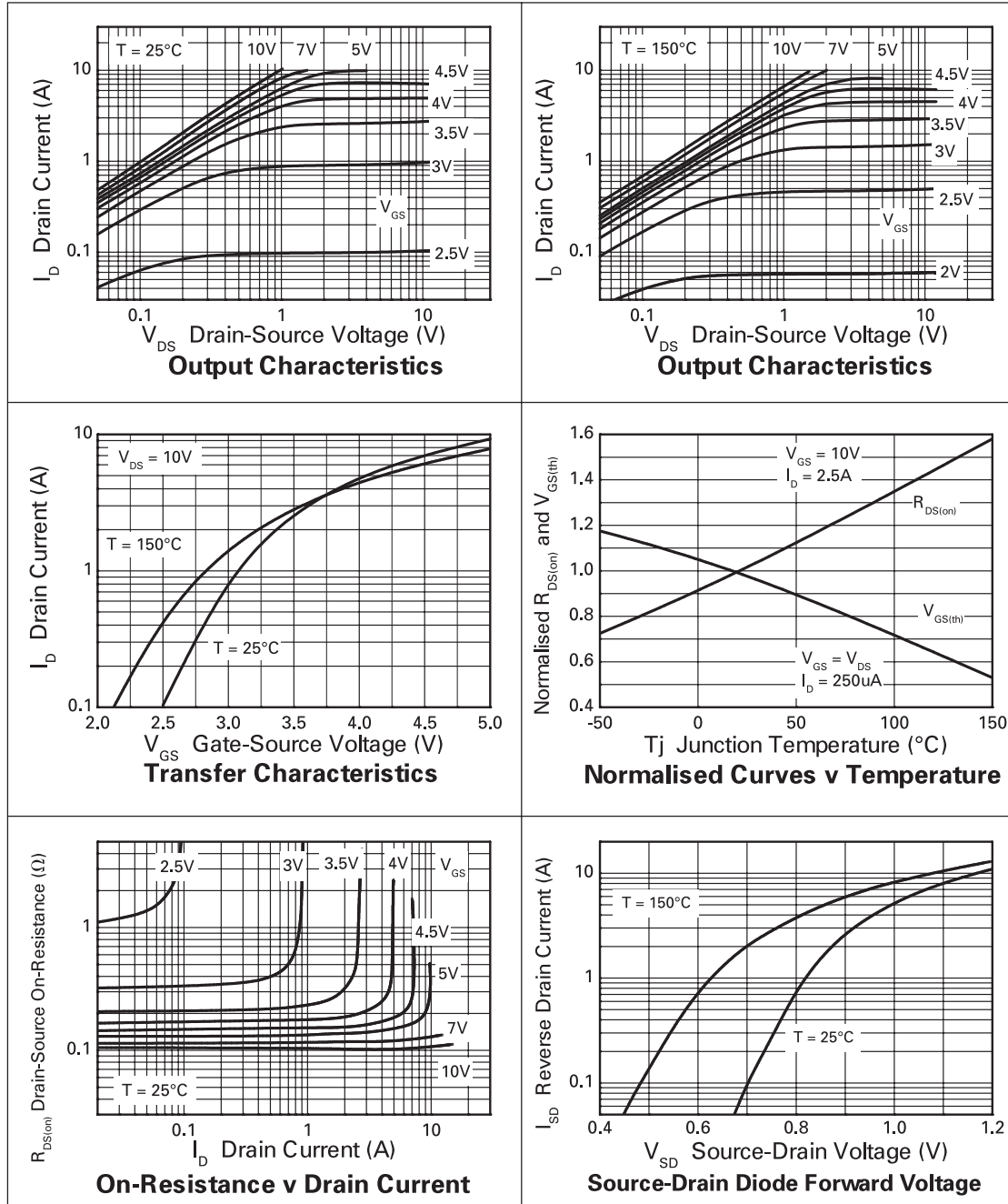
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	30			V	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>			0.5	μA	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V
Gate-Body Leakage	I <sub>GSS</sub>			100	nA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	1			V	I <sub>D</sub> =250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-State Resistance (1)	R <sub>DS(on)</sub>		0.106	0.12 0.18	Ω Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =2.5A V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.0A
Forward Transconductance (1)(3)	g <sub>fs</sub>		3.5		S	V <sub>DS</sub> =4.5V,I <sub>D</sub> =2.5A
DYNAMIC (3)						
Input Capacitance	C <sub>iss</sub>		190		pF	V <sub>DS</sub> =25 V, V <sub>GS</sub> =0V, f=1MHz
Output Capacitance	C <sub>oss</sub>		38		pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		20		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	t <sub>d(on)</sub>		1.7		ns	V <sub>DD</sub> =15V, I <sub>D</sub> =2.5A R <sub>G</sub> =6.0Ω, V <sub>GS</sub> =10V
Rise Time	t <sub>r</sub>		2.3		ns	
Turn-Off Delay Time	t <sub>d(off)</sub>		6.6.		ns	
Fall Time	t <sub>f</sub>		2.9		ns	
Gate Charge	Q <sub>g</sub>		2.3		nC	V <sub>DS</sub> =15V,V <sub>GS</sub> =5V, I <sub>D</sub> =2.5A
Total Gate Charge	Q <sub>g</sub>		3.9		nC	V <sub>DS</sub> =15V,V <sub>GS</sub> =10V, I <sub>D</sub> =2.5A
Gate-Source Charge	Q <sub>gs</sub>		0.6		nC	
Gate-Drain Charge	Q <sub>gd</sub>		0.9		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V <sub>SD</sub>		0.85	0.95	V	T <sub>J</sub> =25°C, I <sub>S</sub> =1.7A, V <sub>GS</sub> =0V
Reverse Recovery Time (3)	t <sub>rr</sub>		17.7		ns	T <sub>J</sub> =25°C, I <sub>F</sub> =2.5A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q <sub>rr</sub>		13.0		nC	

## NOTES

- (1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .  
 (2) Switching characteristics are independent of operating junction temperature.  
 (3) For design aid only, not subject to production testing.

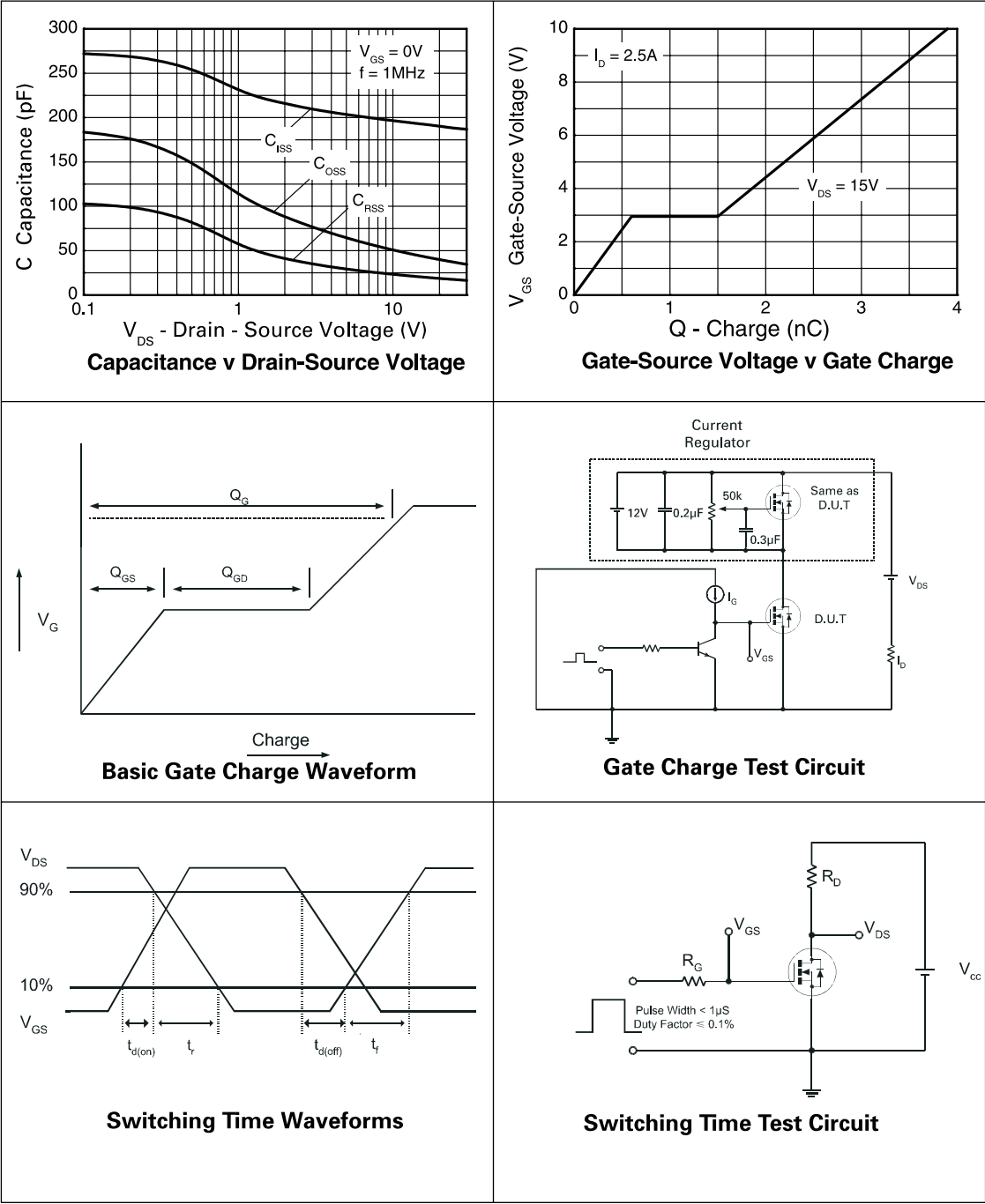
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## TYPICAL CHARACTERISTICS



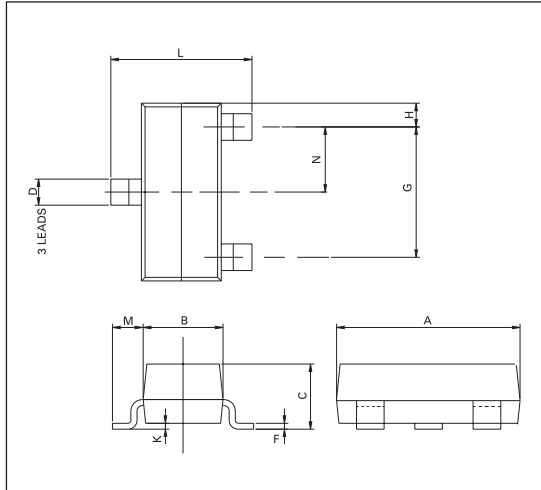
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## TYPICAL CHARACTERISTICS

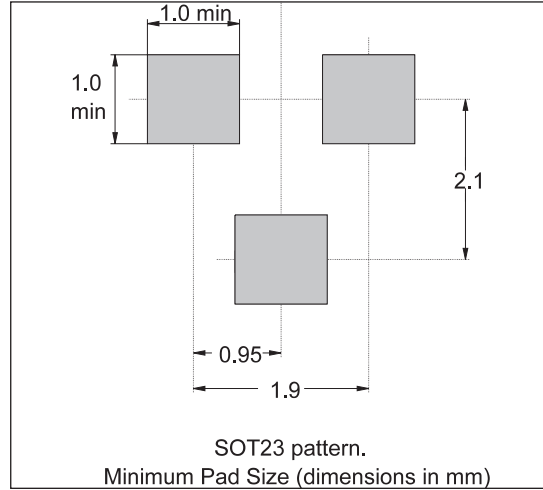


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## PACKAGE OUTLINE



## PAD LAYOUT



## PACKAGE DIMENSIONS

DIM	MILLIMETRES		DIM	MILLIMETRES	
	MIN	MAX		MIN	MAX
A	2.67	3.05	H	0.33	0.51
B	1.20	1.40	K	0.01	0.10
C	—	1.10	L	2.10	2.50
D	0.37	0.53	M	0.45	0.64
F	0.085	0.15	N	0.95 NOM	

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